DIARRHEA-CAUSING *ESCHERICHIA COLI*

Clinical Features: Most strains of *E. coli* are harmless and live in the intestines of healthy humans and animals; other strains may cause disease in humans. The most virulent of these strains is Shiga toxin-producing *E. coli* (STEC), formally known as enterohemorrhagic *E. coli* (EHEC). *E. coli* O157:H7 is the predominant EHEC serotype. Illness due to STEC is usually self-limiting and consists of severe abdominal cramping and bloody diarrhea. Serious clinical manifestations, including hemolytic-uremic syndrome (HUS), a complication that alters normal kidney function, and postdiarrheal thrombotic thrombocytopenic purpura (TTP), a blood and kidney illness that affects the nervous system, may occur, particularly among immunocomprised individuals, young children, and the elderly.

Causative Agent: at least five strains of diarrhea-producing *Escherichia coli* bacteria have been identified: Shiga toxin-producing *E. coli* (STEC), enteropathogenic *E. coli* (EPEC), enterotoxigenic *E. coli* (ETEC), enteroinvasive *E. coli* (EIEC), and enteroaggregative *E.coli* (EAEC).

Mode of Transmission: Transmission of STEC strains occurs via the fecal-oral route, during which susceptible individuals ingest food or liquids contaminated with human or animal feces. Outbreaks of STEC infections have been linked to eating undercooked ground beef, consuming contaminated produce, and drinking contaminated water or unpasteurized juice. Person-to-person transmission may also occur, especially within daycare settings and nursing homes.

Incubation Period: may range from 2-8 days (usually for 3-4 days).

Period of Communicability: The duration of excretion of the pathogen may vary by age group. Adults typically shed STEC for up to one week; however, infected children have been found to shed STEC for three weeks. A prolonged carriage state is not common.

Public Health Significance: Diarrhea-causing *E. coli* is often associated with contaminated beef and food products. Monitoring this disease serves as a potential indicator to problems in meat, fruit, and/or vegetable processing. A product recall may be issued if *E. coli* contamination is suspected—the USDA enforces a "zero tolerance" policy on this pathogen.

Reportable Disease in Kansas Since: 1997

Laboratory Criteria for Surveillance Purposes

- ➢ Isolation of *Escherichia coli* O157:H7 from a specimen, *OR*
- ➢ Isolation of Shiga toxin-producing *E. coli* from a clinical specimen[*]

Surveillance Case Definitions

- ➢ *Suspect*: A case of postdiarrheal HUS or TTP

- ➢ *Probable*:
  - A case with isolation of *E. coli* O157 from a clinical specimen, pending confirmation of H7 or Shiga toxin production, *OR*
  - A clinically compatible case that is epidemiologically linked to a confirmed or probable case, *OR*
  - Identification of Shiga toxin in a specimen from a clinically compatible case, *OR*
  - Definitive evidence of an elevated antibody titer to a known EHEC (also known as STEC) serotype from a clinically compatible case

- ➢ *Confirmed*: A case that meets the laboratory criteria for diagnosis.

Epidemiology and Trends

2005 Kansas Count: 49

	Rate per 100,000	95% CI
Kansas Rate	1.8	(1.3 – 2.3)
U.S. Rate (2004)	*NA*	*NA*

Of the 49 cases of diarrhea-causing *E. coli* reported in Kansas during 2005, 45 were caused by *E. coli* O157:H7. The remaining four cases were attributed to other STEC strains. In 2004, the national incidence rate of *E. coli* O157:H7 was 0.9 per 100,000 population. The national incidence rate of both non-O157 and unserogrouped ETECs was 0.1 per 100,000.

No outbreaks were reported in Kansas in 2005. The three-year median for 2002-2004 was 47 cases.

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[*] Shiga toxin enzyme immunoassay (EIA) laboratory methods only identify the presence of Shiga toxin in a clinical specimen and should not be used as a confirmatory test. Any Shiga toxin positive stool should be sent to the KDHE Laboratory for further identification. K.A.R. 28-1-18 also requires that isolates of positive cultures of *E. coli* O157:H7 and other EHEC, EPEC, and ETEC be sent to the KDHE Laboratory.